

# Reference Guide for Reading a Scientific Journal

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## Overview

- **What is scientific literature?**
- **Find scientific papers**
- **Reading strategies**
  - Identifying your goals
  - Break down each section
  - What to do when you feel overwhelmed reading a paper
- **Note-taking strategies**

## What is Scientific Literature?

- **Scientific Literature** = scholarly writings explaining empirical and theoretical findings related to physical, life or social sciences
  - Way for scientists to share their findings with the scientific community
  - Way for scientists to see pre-existing knowledge in their field or other fields
  - Helps researchers better understand what has already been done and potential future directions for the field - lighting the way for new research
- Scientific Literature serves as the source of information for future research articles and reviews. We can cite (or credit) past literature in new writings
  - Without a citation, this new work would be seen as plagiarism
- **Types of Literature:** Reviews and Research Articles
  - Research Articles = Recently published research
  - Review Articles = Summarizes literature about a particular topic or field
- **Types of Scientific Research** (most applicable for life sciences)
  - Clinical = study of human subjects and involves testing new methods of diagnosis, prevention and the treatment of illness
  - Basic = study of pure scientific phenomena without human subjects
  - Translational = bridges basic and clinical research
- **Components of a Research Article**
  - Introduction
  - Methods and Materials
  - Results
  - Discussion
  - Acknowledgements
  - References
- **Components of a Review Article**
  - Introduction
  - Specific Topic Title
  - Specific Topic Title
  - Specific Topic Title
  - Specific Topic Title
  - Conclusions

- Future Directions (not always present)
- References
- **Process of Peer-Review**
  - 1 ) Scientist submits an article to a journal with the hopes of it being published
  - 2) The journal asks 2-3 experts in the field to review the article
  - 3) The reviewers closely evaluate the article for accuracy, proper data analysis + empirical techniques and confirm that the found conclusions are supported by correctly collected data. They also evaluate how impactful the research is. Journals feel more drawn to accept articles that have a larger impact.
  - 4) The Reviewers send an Acceptance, Revisions or Rejection decision
  - 5) If the article is published, it has been successfully peer reviewed

### Where can you find Scientific Papers?

- UCLA offers access to many scientific journals through the UCLA BON VPN
  - You must be connected to the VPN to gain access to the UCLA purchased access
  - For information on how to connect to to VPN, use the link [here](#)
    - Note: you must have access to DUO dual authentication
- Journal = Place where scientific research is published
  - Some journals are field-specific, some include all major disciplines
  - Scientific journals are Peer-Reviewed, meaning that experts in the field evaluate the paper for accuracy and experimental style prior to publication
- Large Journals that Encompass Multiple Disciplines
  - Science
  - Nature
  - PNAS
- How to use **Google Scholar**
  - Google Scholar is a place where members of the academic community can create a profile highlighting their research interests and publications
  - Helpful Guide: <https://mashable.com/2014/12/03/google-scholar-guide/>
  - Another similar platform to Google Scholar is ResearchGate
- Journals that Include Primarily Life-Science Articles
  - **PubMed**
    - PubMed is a free search engine that contains scientific research articles within life science disciplines.
    - Many life science articles have PubMed ID numbers
  - Cell
  - Plant and Cell Physiology
  - Journal of Neuroscience
  - The Lancet
  - New England Journal of Medicine
- Journals that Include Primarily Physical Science & Engineering Articles
  - IOPscience
  - Physical Review
  - Journal for Applied Physics
  - Physical Review

- Engineering
- ACS Nano
- UCLA Library Research Database Resources
  - Available to UCLA students on the UCLA VPN or on-campus WiFi
  - Resources for writing Reviews and Research Articles
  - Consultation for entering undergraduate research

### Reading strategies:

- Reading strategy will depend on goals\*
  - Learn about the field
    - Abstract and introduction
    - The introduction usually offers detailed background information for the field. The structure of the introduction section usually goes from general to specific. The end of the introduction section usually discusses the specific question that this paper is aiming to address.
  - Learn a method
    - Abstract → Methods
    - The method section usually offers a more detailed procedure for the experiment, the methods they employed to analyze data & draw conclusions.
    - As is the case with other goals, try reading several research papers (at least 3) on the same, or similar topic, compare/contrast the methods they used.
  - Analyze a result (usually when you already have a background in the field)
    - Abstract → Figures (draw your own conclusion based on the figures) → compare your conclusions with the methods and results in the paper → read discussion and conclusion.
  - Have in mind what information you would like to obtain from the research paper in the first place
- Overall, a research paper consists of an abstract, introduction, experimental/methods, results and discussion, conclusion, and figures.
- Abstract & Conclusion
  - If you are just aiming to get the main points or to get a general idea of what this paper is about without going into too much detail into their rationales, the abstract is sufficient. Same with the conclusion. Usually, you can just skim through the abstract and conclusion to get a general idea of what the paper is about.
- Introduction
  - As mentioned above, the introduction gives a more complete summary of the background information/ motivation for the research. This is also where you can identify the question that the paper is trying to address.
- Methods, results and discussion

- You would want to read these as well (in detail) if you wish to delve deeper into the paper.
- These sections may be the most challenging to follow if you do not have the essential background information, very easy to get lost here.
- We will talk about what to do when you feel overwhelmed by reading research papers.
- **Figures**
  - Figures are actually the key in a research paper. Once you read the introduction and understand the question being framed, jumping to the figures and tables gives you an idea of the data. Again, it may be difficult to understand the figures in the first paper you read. It May take some time to figure out what the figures are illustrating, but be patient, once you get through a couple of research papers you will see the trend and will be able to compare the results based on these figures relatively easily.
- **What to do when you feel overwhelmed reading papers**
  - If it's only a few things in the article, make a note to look them up right away or later. (I would suggest pausing immediately to look up things that you don't understand, especially if it is a concept that is repeated multiple times in the paper, otherwise, the rest of the reading may not make sense if you don't understand a key phrase) If you are really struggling to proceed through the paper, try to look up a review article to give the necessary background to proceed
  - It may also be helpful to read some of the referenced papers as necessary to get a more thorough background.
  - Be patient. Know that this is normal. In the beginning, new academic readers find it slow because they have no frame of reference for what they are reading. So to build that reference is essential. Usually, after you've read a couple of papers, you can build that frame of reference.

### **Note-taking strategies\***

- Use color-coded highlighting
- Summarize important information
  - It helps to have a writing task so you are being an active reader instead of letting your eyes glaze over mountains of text only to forget everything you just read.
  - For example, when reading background/introduction, highlight/save informative sentences from each article about a specific topic on a document. This is helpful when you are reading multiple papers and want to compare each study.
- Write out definitions of new words, terms, abbreviations, etc.
- Write out questions to research later or to ask mentor about.

\* Referenced from Dr. Goins' *How to Read Scientific Papers*

